

Abstract

A phase shift mask having transmission properties that are dependent at least in part on an intensity of an incident light beam. The phase shift mask has a mask substrate that is substantially transparent to the incident light beam. A first phase shift layer is disposed on the mask substrate. The first phase shift layer has a refractive index that is nonlinear with the intensity of the incident light beam. The refractive index of the first phase shift layer changes with the intensity of the incident light beam on the phase shift mask. By using a first phase shift layer on the phase shift mask that has a refractive index that is non linear with the intensity of the incident light beam, properties of a light beam transmitted through the first phase shift layer, such as interference patterns in the transmitted light beam, can be adjusted by adjusting the intensity of the incident light beam. Thus, in this manner there is provided an additional tool by which the exposure patterns produced by the phase shift mask can be adjusted. In other words, the transmission properties of the phase shift mask are adjustable with the intensity of the incident light beam.

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